



EP 867458

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Patents Cited by Examiner: 9

Citing Patents: 2

Articles Cited by Inventor: 0  
Articles Cited by Examiner: 3

**Patent Number(s):**

EP867458-A  EP867458-A2  JP2854834-B2; DE69034193-E  


**Title:**

Polyethylene terephthalate chip used for containers for storing beverages - obtained by esterifying terephthalic acid with ethylene glycol, liquid phase polycondensing, optionally moulding into granules, preparing PET and contacting with hot water

**Inventor Name(s):**

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**Patent Assignee Name(s) and Code(s):**

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**Derwent Primary Accession Number:**

1998-497821 [45]

**Abstract:**

A polyethylene terephthalate chip is obtained by: (i) esterifying terephthalic acid or its ester-forming derivative with ethylene glycol or its ester-forming derivative; (ii) liquid phase polycondensing by heating to melt in the presence of a polycondensation catalyst selected from germanium, antimony or titanium compounds; (iii) optionally moulding the polyethylene terephthalate into granules having an average diameter of 2-5 mm, or precrystallising it by heating to a temperature lower than that of the subsequent solid phase polycondensation step; (iv) preparing a polyethylene terephthalate; and (v) subsequently bringing the product of the solid phase polycondensation for 5 minutes to 10 hours into contact with hot water having a

temperature of 40-100C, or passing through the particulate product for 5 minutes to 14 days through water vapour containing gas or water vapour containing air kept at 40-150C in an amount of 0.5 g.

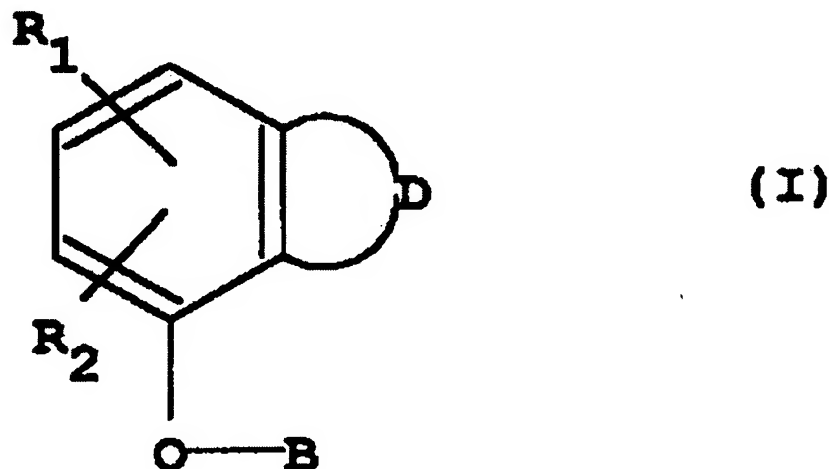
The polyethylene terephthalate prepared in step (iv) has an intrinsic viscosity of at least 0.54 dg/l determined at 25 C by measuring the viscosity of a solution of polyethylene terephthalate in o-chlorophenol, a density of more than 1.38 g/cm<sup>3</sup> and contains less than 0.5 wt.% a cyclic trimer of formula (I) in a solid phase polycondensation step, where the product of (ii) or (iii) is heated in an inert atmosphere to a temperature below the m.pt. of the product.

The above polyethylene terephthalate, used in the chip, has: (a) a rate of polycondensation of less than 0.004 dl/g.hour (215C in inert atmosphere); (b) a content of the cyclic trimer of formula (I) of a stepped square plate satisfying equation:  $Y - 0.20X + 0.16$ , where Y = increased amount (wt.%) of (I) in the stepped square plate; and X = the cyclic trimer content (wt.%) of the polyethylene terephthalate before moulding to the stepped square plate (when the polyethylene terephthalate is injection moulded at a cylinder temperature of 290 C to a stepped square plate and the residence time at this temperature is 72 seconds); (c) a polycondensation rate ratio  $V1/V10$  of 0.2-1.0, where  $V0$  = rate of solid phase polycondensation when subjected to solid phase polycondensation treatment by heating at 215C in inert atmosphere; and  $V1$  = rate of solid phase polycondensation at 215 C in an inert atmosphere of polyethylene terephthalate immersed in hot water of 95C for 8 hours and dried; and (d) a difference  $W0 - W1$  in content of (I) of 0-0.12 wt.% (cyclic trimer content of article obtained by injection moulding polyethylene terephthalate immersed in hot water of 95C for 8 hours and dried, being taken as  $W1$ (wt.%)).

USE - Used for forming containers to be filled particularly beverages such as fruit juices, cooling drinks and carbonated drinks.

ADVANTAGE - The material has excellent mechanical strength, heat resistance, transparency and gas barrier properties.

Drawing:



International Patent Classification:

C08G-063/183; C08G-063/78; C08G-063/80; C08G-063/90; C08G-063/88; C08G-063/85

Derwent Class:

A23 (Polyamides, polyesters, polycarbonates, alkyds); A92 (Packaging and containers, ropes, nets)

Derwent Manual Code(s):

A05-E04E; A12-P01B

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<b>EP867458-A</b>					
<b>EP867458-A2</b>	30 Sep 1998	C08G-063/90	199843	Pages: 22	English
JP2854834-B2	10 Feb 1999	C08G-063/88	199911	Pages: 9	
DE69034193-E	30 Jun 2005	C08G-063/90	200545		

**Application Details and Date:**

<b>EP867458-A2</b>	EP110419	21 Mar 1990
DE69034193-E	DE634193	21 Mar 1990
JP2854834-B2	JP066407	29 Mar 1990

**Further Application Details:**

<b>EP867458-A2</b>	Div ex	Patent	EP389948
<b>EP867458-A2</b>	Div ex	Application	EP105337
JP2854834-B2	Previous Publ.	Patent	JP8231689
JP2854834-B2	Div ex	Application	JP082350
DE69034193-E	Based on	Patent	EP867458
DE69034193-E	EP application	Application	EP110419

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**Field of Search:**

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